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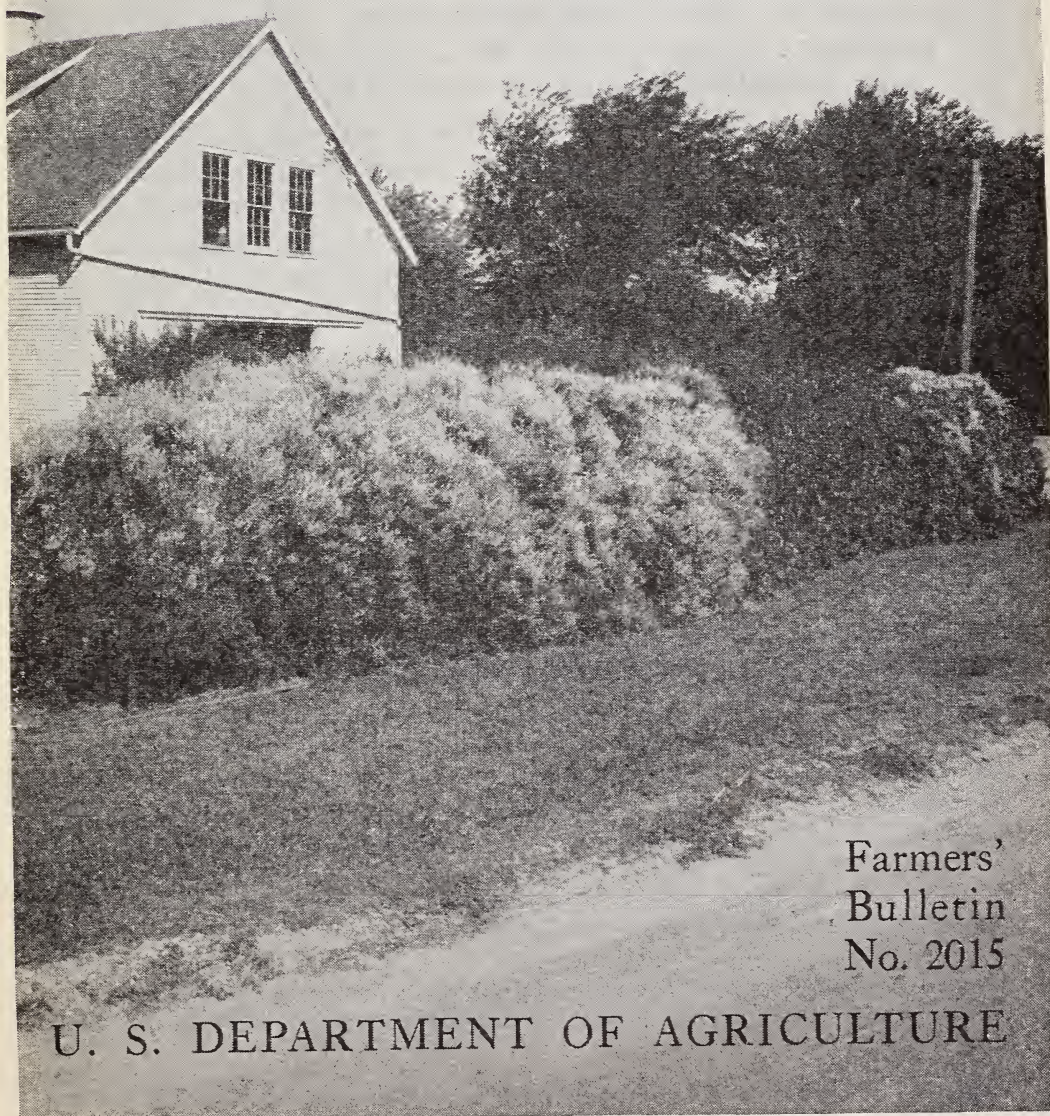
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ORNAMENTAL WOODY VINES

for the
SOUTHERN GREAT PLAINS



Farmers'
Bulletin
No. 2015

U. S. DEPARTMENT OF AGRICULTURE

WOODY VINES are an important part of landscape plans for the farm and ranch homes in the southern Great Plains area. They can be trained on trellises to add to the attractiveness of the general landscape or used to cover unsightly structures. Woody vines covering a garden fence make a more effective wind-break and add to the esthetic value of the garden.

Owing to the severity of climatic and other environmental factors in the southern Great Plains area, the kinds of woody vines that grow well are rather limited. Low precipitation, the wide range and quick changes in temperature, and the tendency of soils to be alkaline, all combine to limit the species and varieties that can be grown successfully. This bulletin discusses the selection, planting, and care of woody vines, describes the various species that have been tested, and suggests their use in the southern Great Plains area.

Washington, D.C.

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Cover illustration.—The fleecelike bloom of China fleecvine and the dark-green foliage of heartleaf ampelopsis make a screen of a corral fence at the Southern Great Plains Field Station.

ORNAMENTAL WOODY VINES FOR THE SOUTHERN GREAT PLAINS

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INTRODUCTION

WOODY VINES play an important role in the landscaping of farm and ranch homes in the southern Great Plains.¹ A traveler, driving over the flat expanse of the Plains, often finds that the tallest object on the horizon is a windmill tower that dwarfs the farm or ranch home. When such an object is covered with vines, it becomes a living green tower that is pleasing to the eye rather than a harsh structure of steel or wood.

Unightly buildings or service areas can be screened effectively by hardy species such as China fleecevine, monkshood-vine, and common Virginia creeper. A trellis at the south side of a porch can be covered with vines that cool the prevailing summer winds. It is quite common to erect a wire or wooden trellis several feet from windows having a south or west exposure and develop a living awning that gives the desired shade. A lattice fence makes an excellent low windbreak for a flower or a vegetable garden in the Plains, and when such a fence is covered with vines its value is increased many times.

Weather conditions on the southern Plains make it necessary to spend considerably more time and effort on the culture of vines than in

¹ In accordance with local usage and to avoid monotony, Plains and southern Plains when used in this bulletin take the place of southern Great Plains to designate the area shown in figure 1.

areas east of the 25-inch-rainfall zone. The training of vines is more difficult because of the almost constant winds in the area. The lowness of the precipitation, the wide range and quick changes in temperature, and the tendency of the soils to be alkaline, all combine to limit the species and varieties of woody vines that can be successfully grown.

Soon after the establishment of the Southern Great Plains Field Station at Woodward, Okla., in 1914, a search was started for woody vines that might be used in the southern Plains. In 1931 a definite plant-material research project was initiated. This included the introduction and testing of species of vines and their propagation, culture, and distribution to cooperative experimental plantings in the area. The notes under "Discussion of Vine Species" are based on the tests made at Woodward and on observations made throughout the southern Plains.

SELECTING VINES

The selection of the type of vine is dependent upon the intended use, the site, and the available moisture. For training on stucco, stone, or brick structures without trellises, select vines that have tendrils with adhesive tips or have aerial rootlets. Such vines are Engelmann ivy, English ivy, trumpetcreeper, euonymus, and Boston ivy. The other species and varieties discussed here require some form of support.

For screen, windmill-tower, pole, and windbreak-fence plantings, the more vigorously growing vines should be used. Vines requiring careful training and heavy watering should be confined to shrub or flower-garden areas where they can be conveniently cared for.

For average soil sites in the southern Plains, all the species listed can be used. China fleecevine, monkshood-vine, and heartleaf ivy are tolerant to a wide variety of soils. Where an extremely alkaline condition exists, it will be necessary to correct the soil condition with iron sulfate or to remove about a cubic yard of soil per vine and replace it with good soil. Matrimony-vine and Virginia creeper are two of the more drought-resistant species, and therefore they can survive in the drier parts of the southern Plains. With irrigation, most of the other vines listed under "Discussion of Vine Species" can be grown. Climbing roses require considerable moisture and protection for best development.

PLANTING AND CARE OF VINES

In the southern two-thirds of the southern Great Plains, vines can be successfully planted all during the winter and early spring if open weather is experienced. If the winter is severe, planting should be deferred until early spring. In the northern third of the southern Plains planting should always be done in early spring.

Select vigorous, healthy 2- or 3-year-old plants for transplanting. They should be planted as quickly as possible after being dug from the nursery row. If the vines have any canes when received, cut them back to within a few inches of the ground level. Dig the hole for planting large enough to accommodate the root system conveniently. Set the vines several inches deeper than the original nursery level, and settle the earth around the roots by watering thoroughly.

Training should start as soon as the vines make sufficient growth.

The canes that have to be fastened to the support should be loosely tied in position with bands of cloth or soft twine. Do not use hard cord or metal fasteners, because they may injure the stems. Be sure to tie the vines loosely. The relatively high wind velocity in the southern Plains makes it necessary to tie the canes to the support at several places so that the canes will not be subjected to whipping by the wind. Fastening of canes to the support should continue as long as new, vigorous growth is developing.

If the vines have a twining characteristic like that of Grecian silk-vine, it is necessary to start the young canes around the support or weave them through the mesh if chicken netting or hog-wire fencing is used. The winds may tend to keep the new growth away from the support; therefore it is advisable to inspect the vines at regular intervals and keep the new growth entwined around the support.

Vines often develop large masses of branches and foliage at the very top of the support rather than distributed evenly over the trellis. Vines of this form can be avoided by pinching back the terminal growth of some of the canes as they develop. Pinching back forces side branching of the canes.

Any winter-injured parts observed in the spring should be removed as soon as possible. Vines that have become "leggy" should be renovated by cutting back the entire plant before new growth starts.

DISCUSSION OF VINE SPECIES

The notes on the vine species include statements as to native habitat, uses, and propagation and a brief summary of their behavior in the southern Plains area. The statements on behavior are based on the data so far accumulated and on observations in the area and therefore should not be interpreted as being entirely conclusive. Some of the species and varieties are relatively new to the southern Plains and have not experienced all of the possible kinds of so-called "unusual" weather that typify the area. The notes on species apply only to the southern Great Plains area as shown in figure 1.

MONKSHOOD-VINE

(*Ampelopsis aconitifolia* Bunge)

Monkshood-vine (fig. 2), a native of China, was introduced into the United States by the Division of Plant Exploration and Introduction. For a number of years it has been growing at the Hays, Kans., and Woodward, Okla., stations. Plantings on 132 sites in 63 counties of the southern Great Plains indicate that it is adapted to a wide variety of soils if it is given average care.

Monkshood-vine has finely cut leaves, rather inconspicuous flowers, and orange-yellow fruits, which are not particularly attractive. Its rampant growth, attractive lacy foliage, and freedom from disease and from insect injury make it worthy of widespread use on porches or pergolas. Monkshood-vine makes an effective low windbreak if grown over a garden fence.

Cuttings of mature wood can be rooted rather easily under glass.

(*Ampelopsis cordata* Michx.)

than 150 varied sites in 72 counties. It has made a good showing even as far west as Cimarron, N. Mex., at an elevation of about 6,300 feet.

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ampelopsis is slow in its juvenile development, but after it has been firmly established it grows vigorously if given just a little irrigation. Like monkshood-vine, heartleaf ampelopsis must be trained as a vine. Heartleaf ampelopsis is recommended as a cover for trellises and fences that act as screens or low windbreaks. (See cover illustration.) It is rather popular for use on windmill and wind-charger towers.

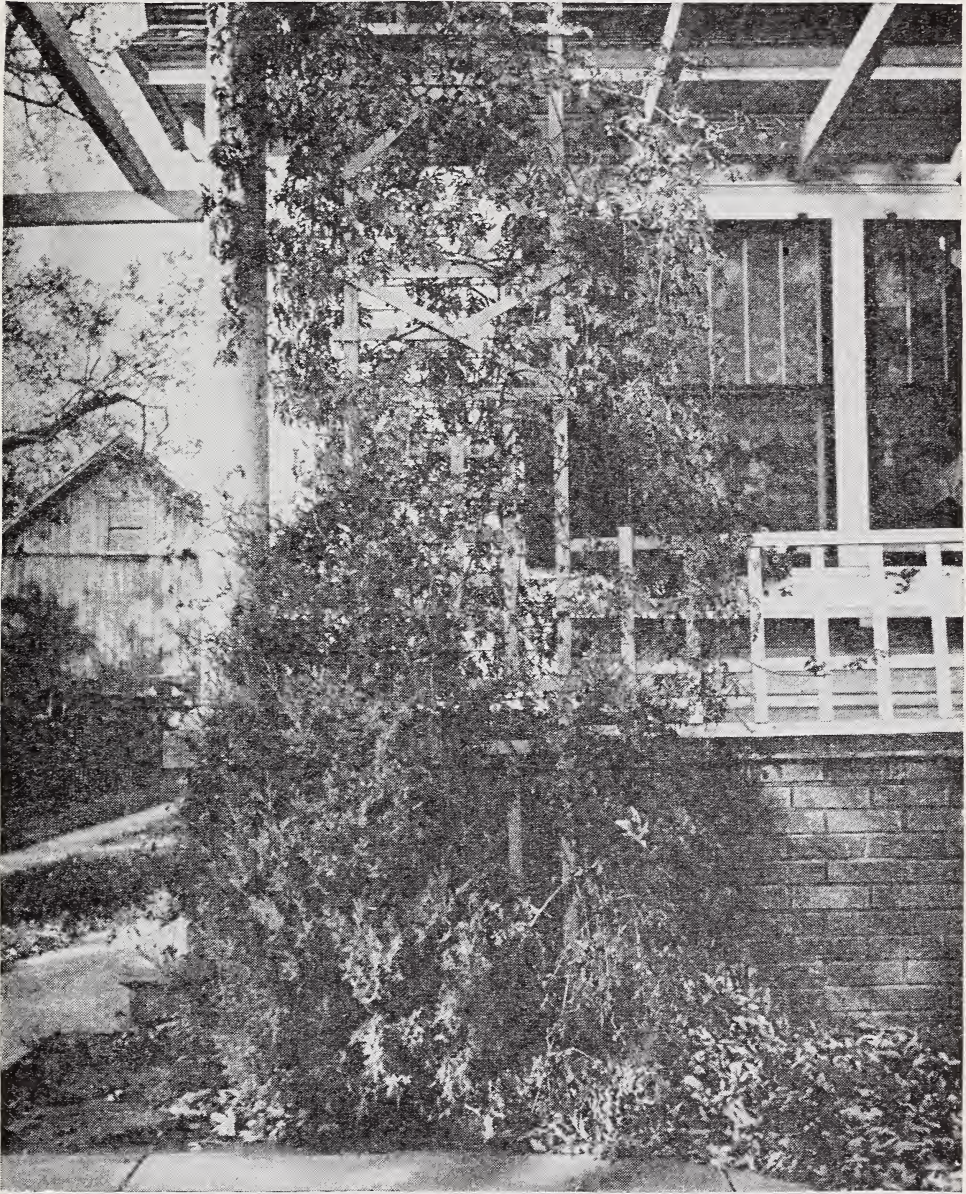


Figure 2.—A young monkshood-vine used as a cover on a porch trellis.

Damage by insects has been very light. In 1942 slight injury by spider mites was noted, and occasional leaf eating by tobacco worms has caused damage.

Propagation is quite simple by planting seeds in the fall or by planting stratified seeds in the spring.

CHINESE TRUMPETCREEPER

(*Campsis grandiflora* (Thunb.) K. Schum.)

Chinese trumpetcreeper (fig. 3) is similar to common trumpetcreeper (*Campsis radicans*), which is native to the United States. At Woodward it has not sprouted as freely as has the common species. Years ago several crosses of this species with *C. radicans*, made at the Woodward station, produced seedlings that ranged in color of bloom from pale orange to red. None of these seedlings proved to be as valuable as the Mme. Galen hybrid, which is available commercially.

COMMON TRUMPETCREEPER

(*Campsis radicans* (L.) Seem.)

Common trumpetcreeper, a native of the eastern United States, has been used very widely in the southern Plains. It is still known to many as *Bignonia radicans* L. rather than as a species of *Campsis*. In common usage it will continue to be known as trumpetvine rather than trumpetcreeper. The species has become a pest in many places and should be planted with caution. Its sprouting habit is commonly known, and until the advent of commercial weed-killing sprays the species was very difficult to eradicate. The sprouting habit of the vine makes it useful in limited areas as a ground cover to prevent soil erosion.

MME. GALEN HYBRID TRUMPETCREEPER

(*Campsis* × *tagliabuana* (Vis.) Rehd. 'Mme. Galen')

Mme. Galen hybrid trumpetcreeper (fig. 4) has found a very useful place in the southern Plains. The large, trumpet-shaped red blooms stand out very boldly against a background of dark-green leaves. Blooming starts during the latter part of June and continues through most of the summer. One of the most valuable characteristics of Mme. Galen trumpetcreeper is that it does not sprout and become a nuisance. This species is most valuable for covering unsightly power poles, telephone poles, and clothesline posts. With a little training it makes an interesting "living post." Mme. Galen trumpetcreeper has been distributed to more than 30 counties in the area and has been a welcome addition to the plant list in all cases. It is not very selective as to soil site. Propagation should be by cuttings.

MARINE IVY

(*Cissus incisa* (Torr. & Gray) Desmoul.)

Marine ivy, or ivy treebine, is of interest primarily because of its unusually heavy, fleshy leaves. From Missouri and Kansas south through Texas, it has been found native on many adverse sites. In the Woodward district it has been found crawling over rocks at the entrance of bat caves; south of Chillicothe, Tex., it grows among the junipers; and near Presidio, Tex., in the lower Big Bend country, it has been noted on extremely adverse sites. Near Presidio was found a type that had only one or two spindly canes growing from large underground tubers 8 inches in diameter and somewhat more in length. At the Woodward station a vine growing on a wire netting for the past 10 years has made an excellent cover. In addition to



Figure 3.—Young profusely blooming plants of Chinese trumpetcreeper trained on power poles at the Southern Great Plains Field Station.

having unusually thick leaves, older vines bear heavy crops of small berries that are almost black when mature. The species makes an interesting ground cover and has possibilities as a soil-erosion-control plant. Continued observations are being made in 39 counties throughout the southern Plains. Propagation is by seed or division of clumps of tubers.

DRUMMOND CLEMATIS

(*Clematis hirsutissima* Pursh)

Drummond clematis, virgins-bower, or old-man's-beard is a vine native to Texas, New Mexico, and Arizona. It has been tested at Woodward since 1935 and has been observed on a wide variety of



Figure 4.—Mme. Galen trumpet creeper used on clothesline posts at a cooperative experimental planting in southwestern Kansas.

sites over the western part of the area. The creamy-white flowers produced in summer are followed by masses of seeds having dull-white feathery appendages. These fluffy seeds often blanket the entire plant, giving Drummond clematis the common name of "old-man's-beard." This vigorous, drought-resistant species makes an excellent vine for covering fences on adverse sites. Propagation is relatively simple by seed.

SWEETAUTUMN CLEMATIS

(*Clematis dioscoreifolia* Lev. & Van. var. *robusta* (Carr.) Rehd.)

Sweetautumn clematis (fig. 5) is an introduction from Japan. The species has been under observation at Woodward since 1932, but it

has had only limited distribution in the southern Great Plains. At Woodward it has to be planted on sites having irrigation and needs protection from southerly winds. It has no place on dryland sites. Grown as a small bush on the ground or on a low pillar, it produces, in the fall, a mass of fragrant white flowers, followed by seeds having



Figure 5.—Sweetautumn clematis growing on a low support at the Southern Great Plains Field Station.

silvery-white plumelike appendages. The seeds persist for several weeks and give the plant an attractive mistlike appearance. Propagation is by seed.

WINTERCREEPER EUONYMUS

(*Euonymus fortunei* (Turcz.) Hand.-Mazz.)

Purpleleaf wintercreeper euonymus (*Euonymus fortunei* forma *coloratus* Rehd.) is a trailing vine and is evergreen on protected sites at Woodward. This form, like others of the species *fortunei*, is very slow in rate of growth in the southern Great Plains. It clings lightly to brick, stone, or stucco and should be confined to the north side of walls as far west as Woodward.

Closely related vines that have been tried at Woodward and have had limited distribution include glossy wintercreeper euonymus (*Euonymus fortunei* forma *carrierei* (Vauvel) Rehd.) and bigleaf wintercreeper euonymus (*E. fortunei* var. *vegetus* Rehd.). Both require considerable moisture for their best development and have limited use in the Plains. Their handsome foliage and fruits are interesting, and their use as low trailing vines on north walls is suggested.

ENGLISH IVY

(*Hedera helix* L.)

Ivy, usually known as English ivy, is an Old World species that has been in cultivation since ancient times. Many selections are grown, and several are available commercially. Tests at Woodward and observations in many other parts of the Plains indicate that the species prefers protected sites. It suffers from cold during the winter and from dry heat of the summer. One selection of English ivy has been growing successfully at Woodward for many years and has been propagated for limited distribution. It clings to any rough surface and will completely cover a brick fireplace chimney. Propagation of the various forms is very simple by planting cuttings in sand or water or by layering.

Baltic ivy (*Hedera helix* 'Baltica' Rehd.) and bunchleaf ivy (*H. helix* 'Conglomerata') have been propagated for limited distribution. The latter selection is interesting in that the leaves are small and very dense. Because it is slow in rate of growth, it should not be planted adjacent to the more rapidly growing kinds of vines.

EVERBLOOMING HONEYSUCKLE

(*Lonicera* × *heckrottii* Rehd.)

The outstanding characteristic of everblooming honeysuckle (fig. 6) is the amount of bloom. Starting in spring, this hybrid honeysuckle continues to bloom throughout the growing season. The buds and outer parts of the bloom are of an attractive purplish-red color, and the inner part is yellow. The blooms have a very pleasing fragrance. The everblooming honeysuckle is slow-growing, requiring 5 to 6 years to develop a good cover for a 3- by 6-foot trellis at Woodward. It is not as vigorous as Japanese honeysuckle and, therefore, is not as useful as a ground cover or for a low hedge. It is under observation in 32 counties. Selections of everblooming honeysuckle have been made by commercial growers, and one distinct type is available. Propagation is by cuttings.

JAPANESE HONEYSUCKLE

(*Lonicera japonica* Thunb. and selections)

Japanese honeysuckle, the common half-evergreen twining shrub, has become naturalized in some of the Eastern States. It can be used in the southern Great Plains only on sites where plenty of irrigation



Figure 6.—Everblooming honeysuckle trained on the testing arbor at the Southern Great Plains Field Station.

is possible, but no other species gives so much satisfaction for the small amount of extra care needed. The characteristic fragrance of Japanese honeysuckle makes it very desirable for planting at the entrance to yards or residences. This species has to be trained if used as a vine,

but it is just as useful as a hedge, as a ground cover, or as a low bush. It can be propagated by layers or seed.

Several selections of Japanese honeysuckle are available from nurseries. An excellent one of these, Hall's Japanese honeysuckle (*Lonicera japonica* 'Halliana'), has creamy-white flowers that turn yellow. A so-called "everblooming" variety has a longer blooming period than the other two listed.

TRUMPET HONEYSUCKLE

(*Lonicera sempervirens* L.)

Trumpet honeysuckle is native from Connecticut to Florida and Texas. It is a twining vine that has not shown as much vigor as other honeysuckles in the southern Plains. The bloom is an attractive orange scarlet on the outside and yellow on the inside. Trumpet honeysuckle blooms usually in spring and early summer, but there is an occasional scattered bloom in the fall. Tests so far indicate its use only as a secondary species. Trumpet honeysuckle grows best in the southeastern section of the area, where the moisture conditions are more favorable.

CHINESE MATRIMONY-VINE

(*Lycium chinense* Mill.)

Chinese matrimony-vine, or Chinese wolfberry, produces a series of long canes that can be trained on a low trellis or fence. The species is very aggressive and sprouts freely. When not carefully controlled, it forms heavy thickets. It is recommended only for the more adverse sites where other vines cannot be used in the southern Great Plains. It has gray-green foliage and small purple flowers, followed by red berries that persist far into the winter. It makes an excellent cover for small game animals and birds. If it was not for its bad sucker-ing habit, Chinese matrimony-vine could be recommended for the entire southern Plains.

COMMON VIRGINIA CREEPER

(*Parthenocissus quinquefolia* (L.) Planch.)

Common Virginia creeper, native to the eastern half of the United States, can be found covering many fences and porches in the southern Plains. It is very drought-resistant and was brought in by the early settlers. It requires a trellis for support. Propagation is by layers or seed.

ENGELMANN IVY

(*Parthenocissus quinquefolia* 'Engelmannii' (Rehd.) Rehd.)

Engelmann ivy (fig. 7), or Engelmann Virginia creeper, has been used freely in the southern Great Plains. For a number of years it has been subject to leafhopper attack and has therefore lost favor in many parts of the area. Now that the insect can be controlled relatively easily with DDT, Engelmann ivy can again be used successfully. Engelmann ivy is very aggressive and quickly covers a trellis. When growth becomes too heavy, the entire plant can be cut off at the ground

level and in a relatively short time a mass of fresh green foliage will cover the entire trellis. An old plant at the Woodward Station was still making a vigorous growth when it had to be removed because of building operations.

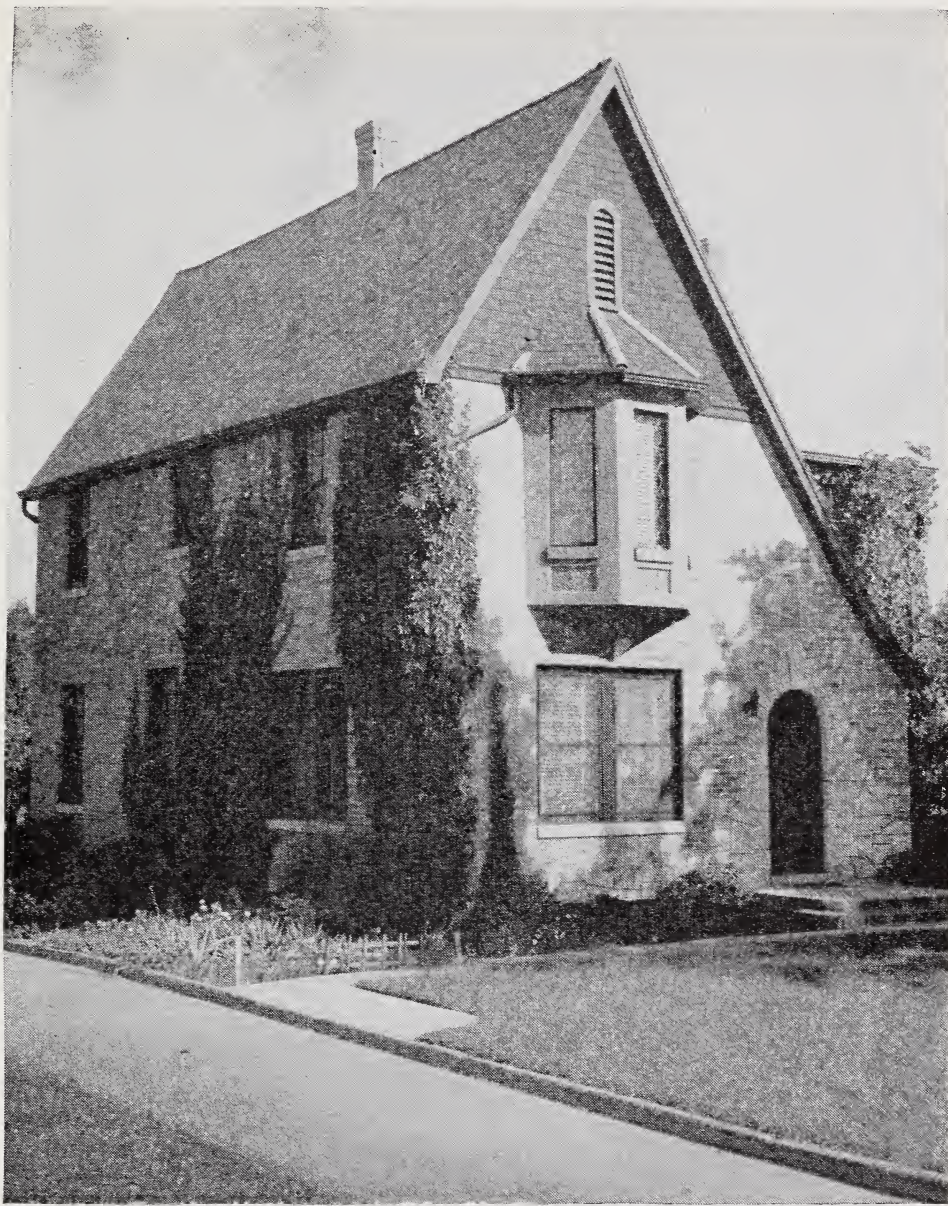


Figure 7.—Engelmann ivy used as a cover on the north side of a stone residence, Woodward, Okla.

BOSTON IVY

(*Parthenocissus tricuspidata* (Sieb. & Zucc.) Planch.)

Boston ivy (fig. 8), also called Japanese creeper, comes from Japan and China. It has become very popular over a large part of the United States. Being able to cling to most kinds of surfaces without the aid of trellises, the species has been freely used in all parts of the

southern Plains where winter weather is not too severe. It does not grow well on the south exposure of buildings in most of the area, but makes an excellent growth on north walls. As far west as Woodward it occasionally kills back to the ground, making removal of all dead wood necessary. Recovery has been very good, the older plants making a complete cover in one season. Distribution of Boston ivy has been



Figure 8.—Boston ivy on the north side of a stucco building at the Southern Great Plains Field Station.

made to 20 counties scattered throughout the area. The tests indicate that northwest of a line through Woodward, Okla., and Lubbock, Tex., Boston ivy should be used only with considerable protection. The lustrous leaves, which turn to a brilliant scarlet in the fall, make the species well worth trying even where it kills back to the ground some seasons. It can be propagated by using seed or cuttings.

GRECIAN SILKVINE

(*Periploca graeca* L.)

Grecian silkvine (fig. 9) of southern Europe and western Asia has long been a favorite vine on the porches of many farm homes in west Texas. Strong, flexible canes often grow 30 feet and more in length.

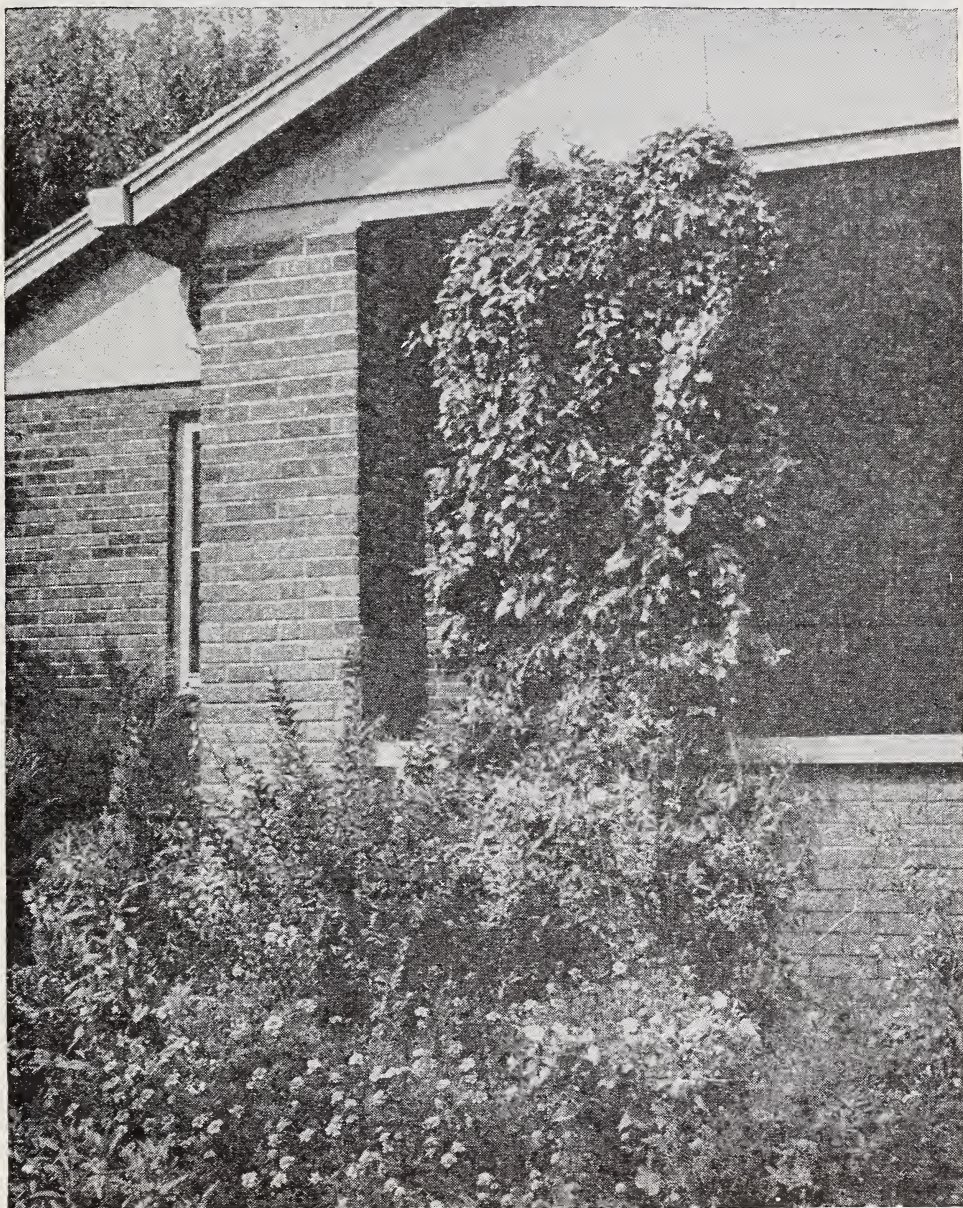


Figure 9.—Grecian silkvine, which makes a dense growth that shades part of the porch and serves as a partial windbreak, on the south side of a farm residence, Ford County, Kans.

Usually a series of these canes become entwined, producing a bundle of twisted vines 2 or 3 inches in diameter. The foliage is made up of attractive, very dark green, glossy, pointed leaves measuring up to 4 inches in length. The blossoms are almost star-shaped, with brownish-

purple centers and green margins. These are not conspicuous, but are partially hidden in the foliage; and they have a slight, rather disagreeable odor. The seeds are borne in milkweedlike pods that persist through most of the winter. Grecian silkvine makes an attractive ground cover when planted in full sun. It is under observation in more than 65 counties of the southern Plains and has proved satisfactory as far west as the mountains in Colfax County, N. Mex. Propagation is by seed, layers, or cuttings.

CHINESE SILKVINE

(*Periploca sepium* Bunge)

Chinese silkvine, a species very similar to Grecian silkvine, has been under observation since 1935 at the Woodward station. The vine is more slender than that of Grecian silkvine, but the species have only slight botanical differences. Chinese silkvine has shown considerable vigor, but it has not been superior to Grecian silkvine. It requires training on wires or trellises.

CHINA FLEECEVINE

(*Polygonum auberti* L. Henry)

China fleecevine (fig. 10 and cover illustration), silver-lace vine, or silvervine fleecflower is a vigorous vine that has been successfully transplanted in the southern Great Plains, far from its native Chinese habitat. The bright-green foliage is literally hidden in a fleecy mass of very small greenish-white flowers in late summer and fall. China fleecevine is the most rampant-growing vine that has been tested in the southern Great Plains. A transplant entirely covers a good-sized trellis in one season. The species prefers full light, but tolerates partial shade; it is not as showy in partial shade.

Initial tests were started at Woodward in 1933; the vigorous character of China fleecevine prompted further testing until now the species is under observation in experimental plantings in more than 50 counties. Observations so far made in the southern Plains indicate that older plants very often "spend themselves" and because of the weakened condition are subject to winterkilling. Propagation has been very unsatisfactory at Woodward. No viable seeds have been produced so far. Cuttings of all types have been used, but only a very small percentage of rooting has been obtained. Treatment of cutting wood with various growth stimulants has proved ineffective. Cutting wood of the same size and age taken from plants growing under more favorable conditions has given better results, indicating that the condition of the wood may be the important factor.

KUDZU

(*Pueraria lobata* (Willd.) Ohwi)

Kudzu (fig. 11), an introduction from China and Japan, has been given widespread publicity in nearly all rural publications. Along the eastern fringe of the southern Plains in Oklahoma and Texas it can be successfully grown as an ornamental vine. As far west as Woodward it usually freezes back to the ground every winter. It has made a rapid recovery each successive growing season, the vine cover-

ing a trellis along a two-story building. Occasionally a small amount of wood escapes injury and produces a scattering of attractive spikes of purple flowers. The large leaves and rampant rate of growth of the species make it an interesting vine to use in the milder parts of the southern Plains. Propagation is by divisions, cuttings, or seed.

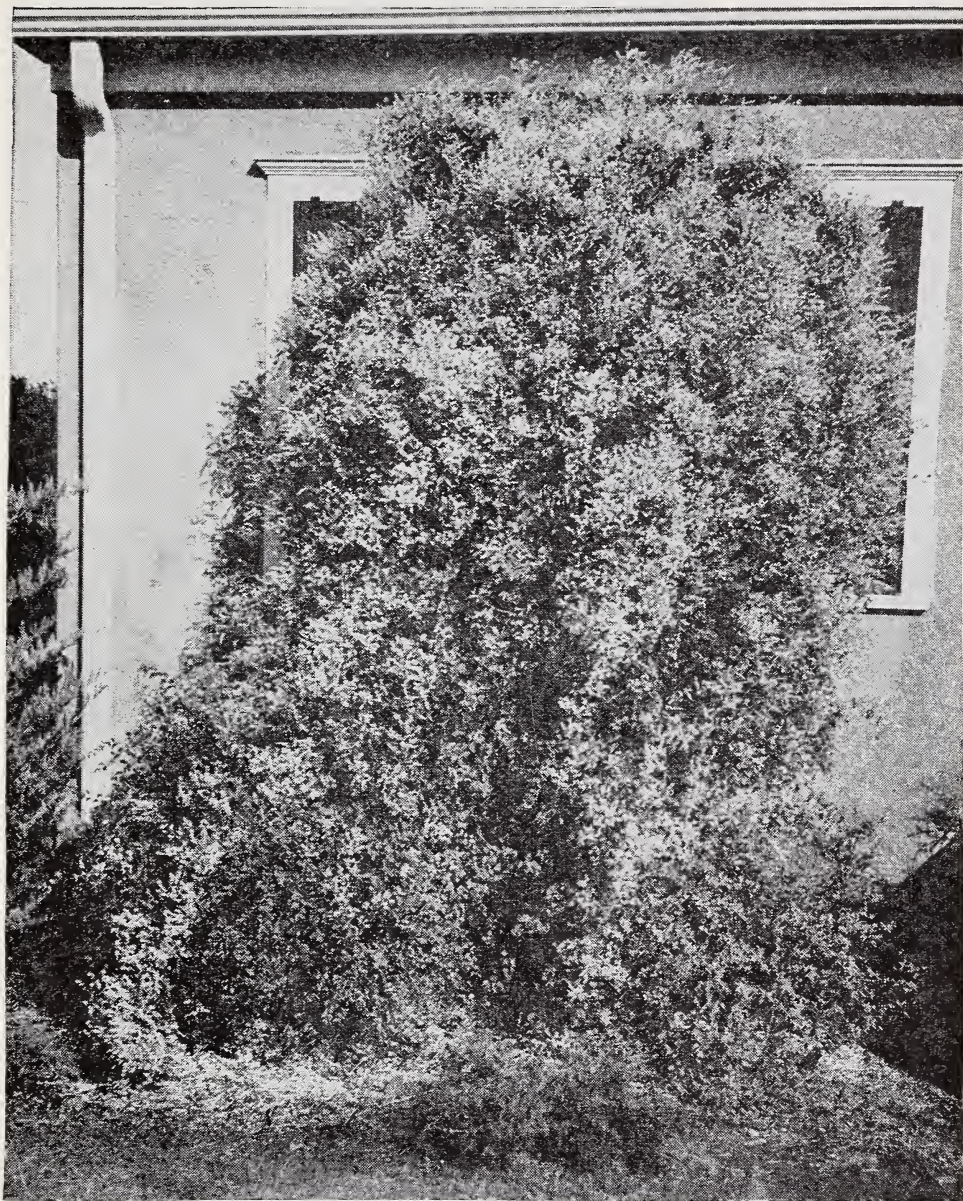


Figure 10.—China fleecyvine used as a living screen on the west side of a residence at the Southern Great Plains Field Station.

CLIMBING ROSES

(*Rosa* spp.)

Climbing roses always have been used on trellises, on all parts of an old-fashioned porch, on arches over garden or yard entranceways, and as covers for old tree stumps that for some reason were not dug

out; and their use should be continued. A few hardy climbing roses in bloom often attract more passers-by than big beds of annual or perennial flowers. Those that develop a large number of canes of small caliper are more easily trained along low fences than on high trellises. Roses tend to be chlorotic on many of the soils found in the southern Plains. Such soils need iron sulfate or other treatment so

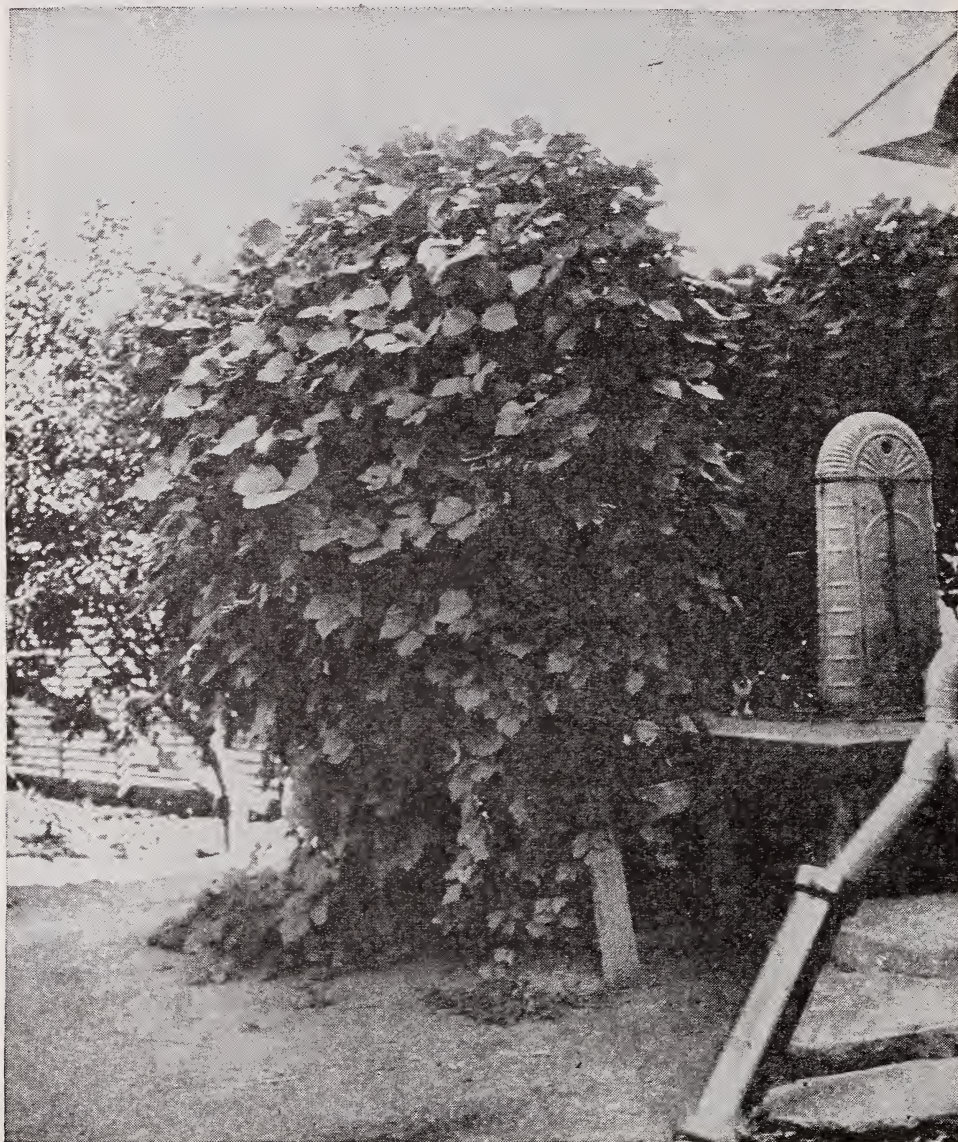


Figure 11.—Kudzu growing over a porch post, Alva, Okla.

that roses will have their normal color. In addition, most roses need considerable irrigation. Exceptions are varieties used along fences, where they can be regularly cultivated on one side. The cultivated strip should be 10 to 15 feet wide so that plenty of soil area will be available for the roses. Planted several rods apart, roses change the appearance of a fence from an ugly barrier to a very pleasing border. At the Southern Great Plains Field Station, Mary Wallace,

American Beauty, and Paul's Scarlet climbers have survived and made an excellent showing when handled in this fashion.

There are many varieties of climbing rose to choose from. Many of these are very sensitive to the soils and the wide fluctuations in temperature in the southern Plains. The climbing-rose list should

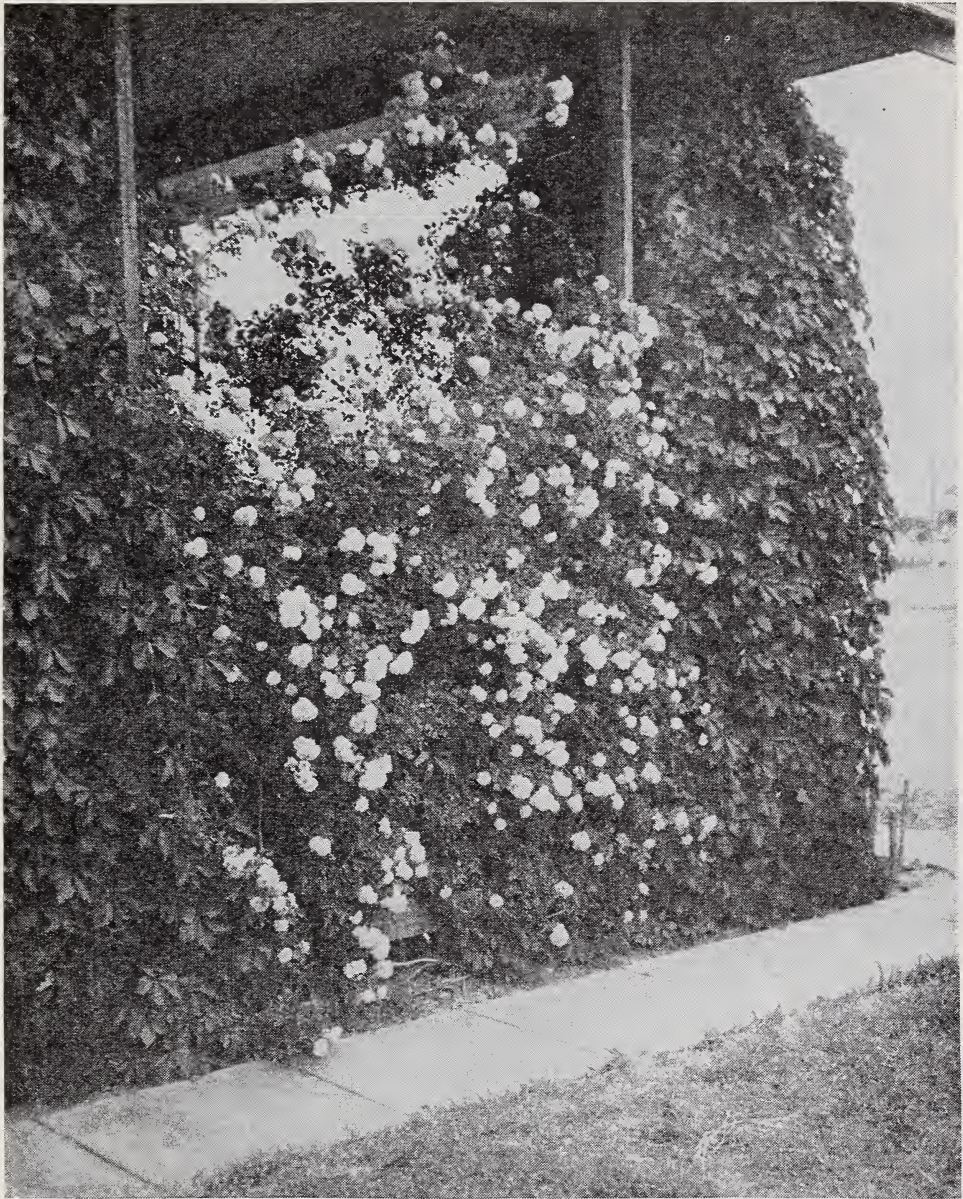


Figure 12.—Dorothy Perkins climbing rose, flanked on either side with Engelmann ivy and covering a wire trellis on a porch, Woodward, Okla.

be confined to the hardier varieties such as American Beauty, Dorothy Perkins (fig. 12), Mary Wallace, Paul's Scarlet, and Silver Moon. Distribution records and observation notes indicate that among these varieties Paul's Scarlet has made the best showing on a majority of planting sites in the southern Great Plains.

GRAPES

(*Vitis* spp.)

The grapes native to the various sections of the southern Great Plains can well be used as ornamentals. Several of these wild grapes, including Longs grape (*Vitis acerifolia* Raf.), can be propagated for

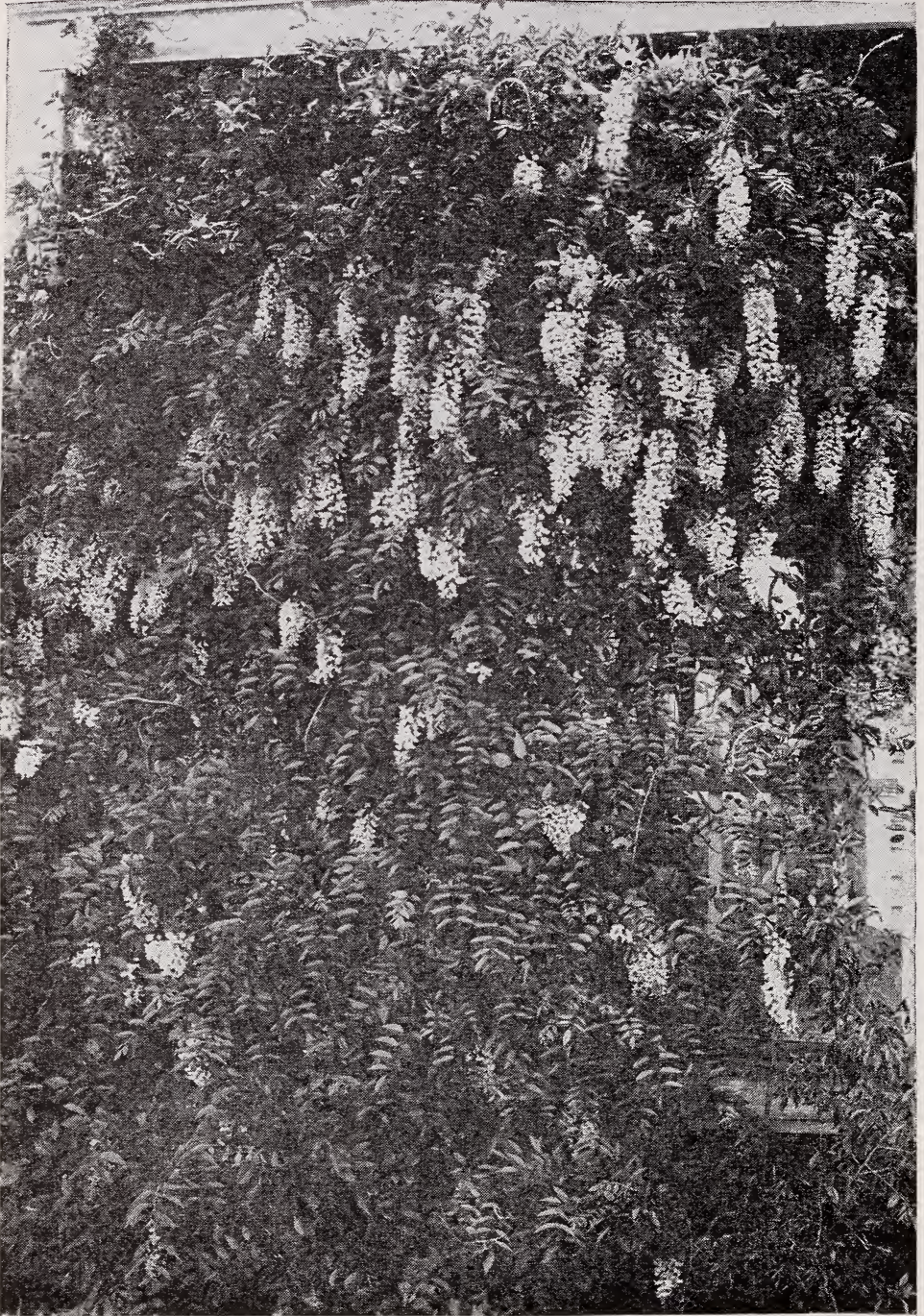


Figure 13.—Japanese wisteria covering the north side of a porch of a residence, Woodward, Okla.

training on fences and trellises in the southern Plains. By observing the wild grapes during the blooming and fruiting periods and later obtaining cuttings from both male and female plants, one could grow plants that produce fruit. Plant 1 male vine for every 3 or 4 female plants. Of the many cultivated varieties of grapes that could be used as ornamental vines, the best varieties to use in most of the southern Plains are Beacon, Extra, Carman, and Ellen Scott. For the higher elevations Alpha and Beta would be preferable. By pruning back the large-fruited varieties each winter a crop of fruit as well as an ornamental vine can be successfully grown. When pruning arbor grapes, remove entire old canes back to one of the main trunks. Leave 10 to 15 buds on several of the small canes that were produced the previous growing season. All grapes prefer a deep, sandy soil.

JAPANESE WISTERIA

(*Wisteria floribunda* (Willd.) DC.)

Japanese wisteria (fig. 13) has survived on a protected site at the Woodward station, but it does not bloom as profusely as under more favorable growing conditions farther east. The wisterias have long been prized for the delicate fragrance and showiness of the long panicles of bloom. The vine can be used in the 25-inch-rainfall zone in the eastern part of the southern Great Plains. In the remainder of the area it should be limited to protected sites having irrigation.

CHINESE WISTERIA

(*Wisteria sinensis* (Sims) Sweet)

Chinese wisteria has been under observation since 1938. Like Japanese wisteria, it requires considerable moisture and protection.

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